Expansion of the Universe

- The text below is only an example. You can draft the notes in any way you want. A convenient approach is to list the salient points in bullets. Put all the necessary equations in. If you can find online a figure corresponding to the figure shown in class, include that as well.

- Cosmology is the scientific study of the large scale properties of the universe as a whole. It endeavors to use the scientific method to understand the origin, evolution and ultimate fate of the entire Universe. Like any field of science, cosmology involves the formation of theories or hypotheses about the universe which make specific predictions for phenomena that can be tested with observations. Depending on the outcome of the observations, the theories will need to be abandoned, revised or extended to accommodate the data. The prevailing theory about the origin and evolution of our Universe is the so-called Big Bang theory.

- The term redshift is defined as a dimensionless number z, where

$$z = \frac{\lambda_{obs} - \lambda_{rest}}{\lambda_{rest}} \tag{1}$$

- Historically, the measurement of H_0 has fluctuated a great deal.

  1. 1940 - 1960s (Baade & Sandage) : 50 - 150 km s^{-1} Mpc^{-1}
  2. Hubble Key Project (2001) : 72 $\pm$ 8 km s^{-1} Mpc^{-1}
  3. WMAP (2003, 1 year data) : 72 $\pm$ 5 km s^{-1} Mpc^{-1}
  4. WMAP (2011, 7 year data) : 70.2 $\pm$ 1.4 km s^{-1} Mpc^{-1}
  5. Planck (2013) : 67.3 $\pm$ 1.2 km s^{-1} Mpc^{-1}

- The following figure explains the trend in the expansion of the universe